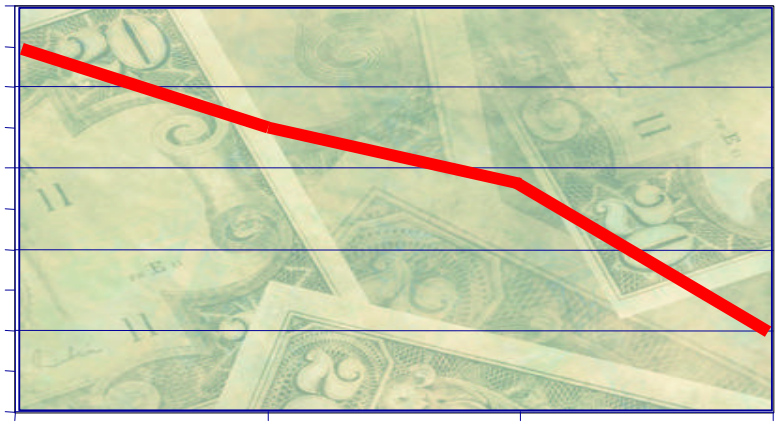
The Solid State Energy Conversion Alliance: A Paradigm Shift in Technology Development

Solid State Energy Conversion Alliance Workshop

June 1-2, 2000

Rita A. Bajura, Director
National Energy Technology Laboratory

The Vision: *Fuel Cells in 2010*

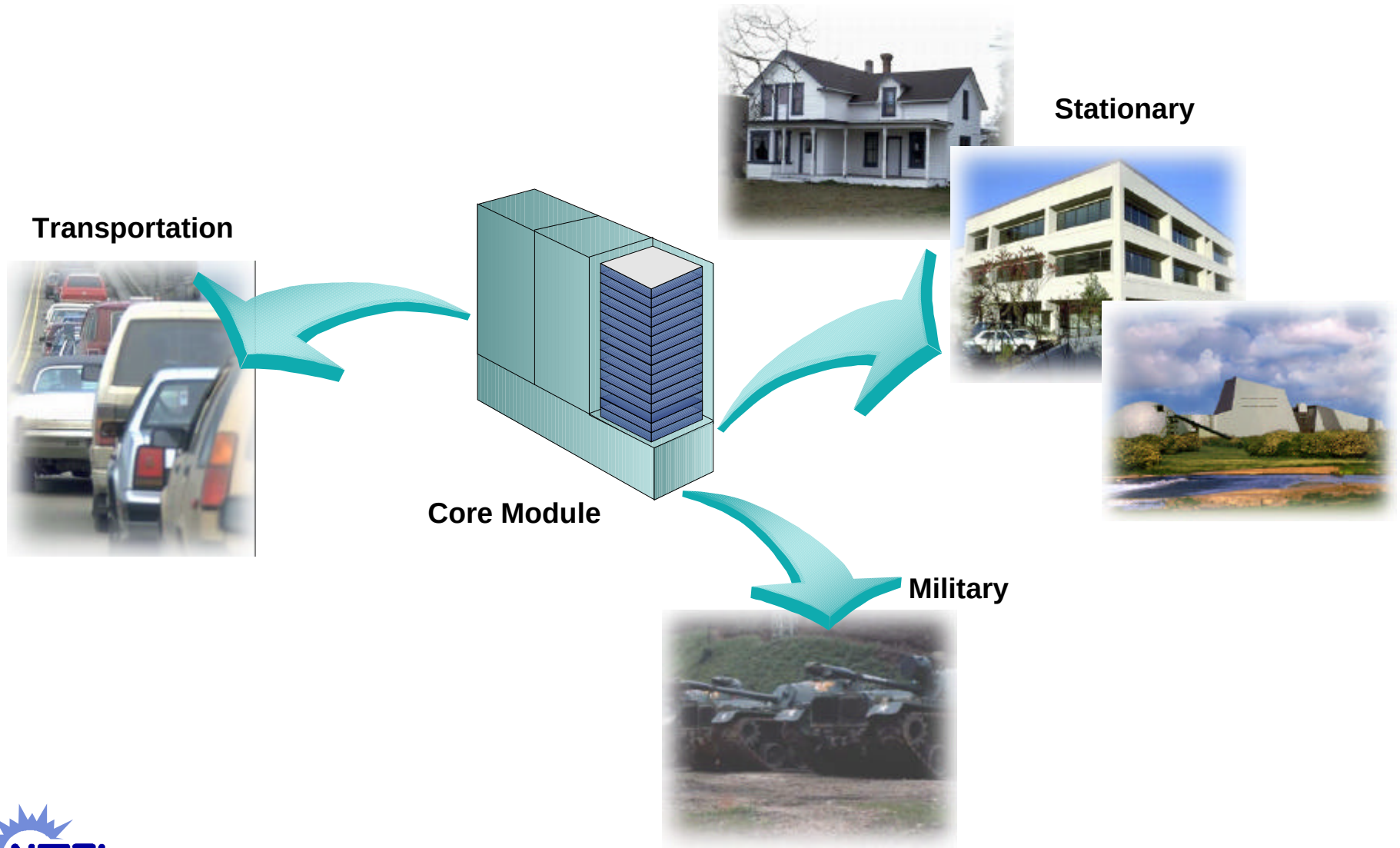


Low Cost
$400/kW

Multiple Fuels

Reduced CO_2 Emissions

The Vision: *A Core Module for Multiple Applications*



SECA - Realizing the Vision

SECA:

- **An alliance of industry teams, R&D performers, and government funding organizations**
- **Develops an integrated strategy**
- **Focuses research**

SECA Structure

Industry Input

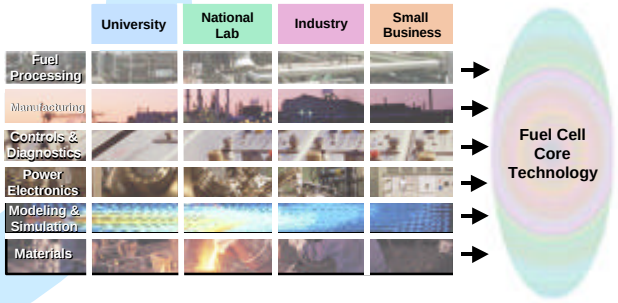
Program Management

Project Management

Needs

Research Topics

Industry Integration Teams



Core Technology Program

Technology Transfer

SECA Industry Integration Teams

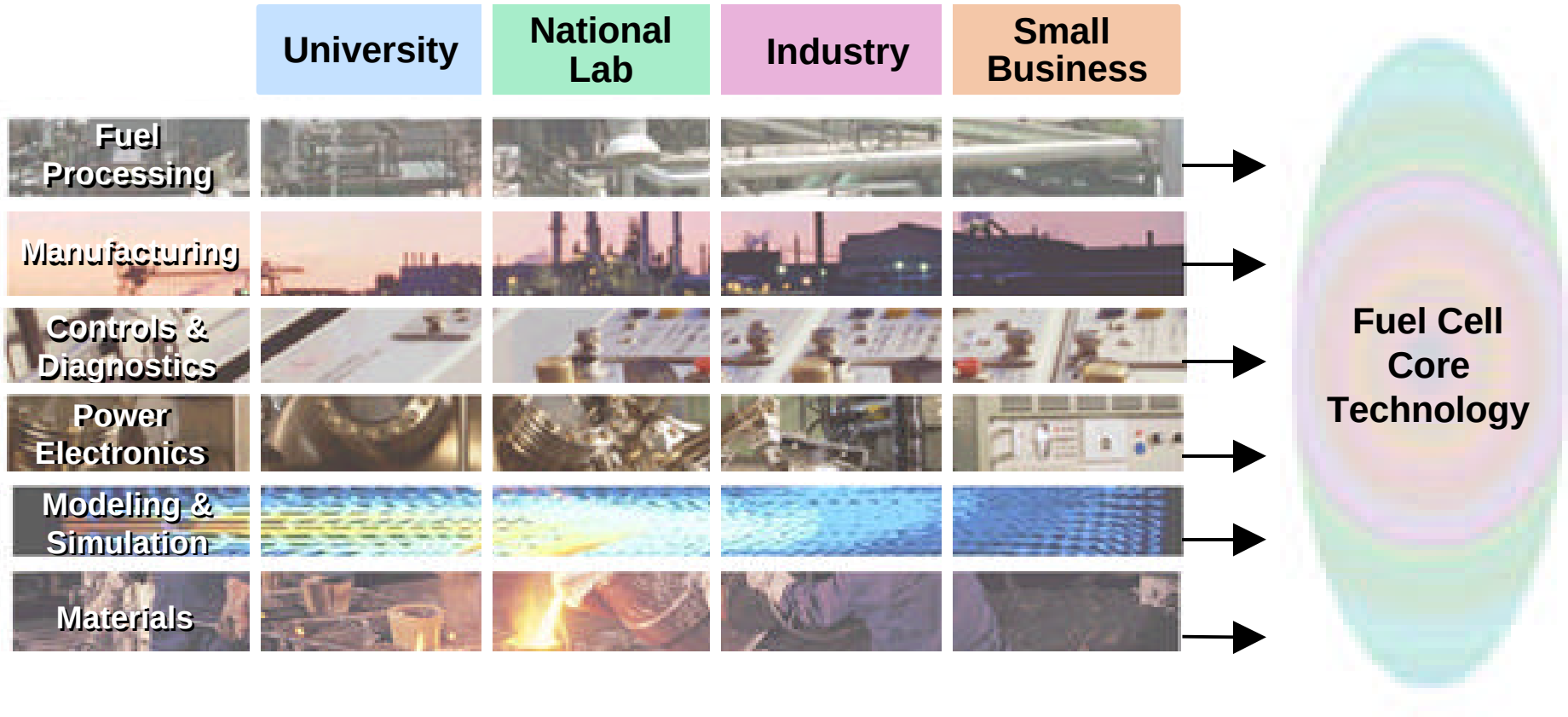
The Manufacturing Base

Multiple Integration Teams

Mass Customization of Common Modules

Core Technology Program

The Technology Base



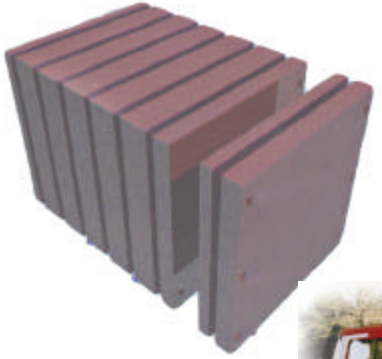
Intellectual Property - Cornerstone of the Alliance

SECA

Solid State - The Choice for the New Millennium

- Inherently high efficiency
- Couples with high-temperature reforming
- Simple and efficient heat removal designs
- Low-cost manufacturing

SECA - Now is the Time



- **Breakthrough in materials, designs, and manufacturing**
- **Market forces**
- **Environmental concerns**

Status of the Market
Stationary

- **Major market penetration requires cost ≤ $400/kW**
- **Breakthrough technologies needed to reduce costs**
- **Environmental concerns driving DG to very clean systems**

Status of the Market
Transportation

- **Potentially low system costs operating on available fuels**
- **Adaptable to standard transportation fuels**
- **High efficiencies**
- **Low emissions**

Status of the Market
Military

- **Requires high efficiency, low signature power systems**
- **Fuel logistics are critical**
- **Electric drives/field power increasingly important**

A Paradigm Shift
Overcoming the Pull of The Past

Cleaner, more efficient way to use fossil fuels

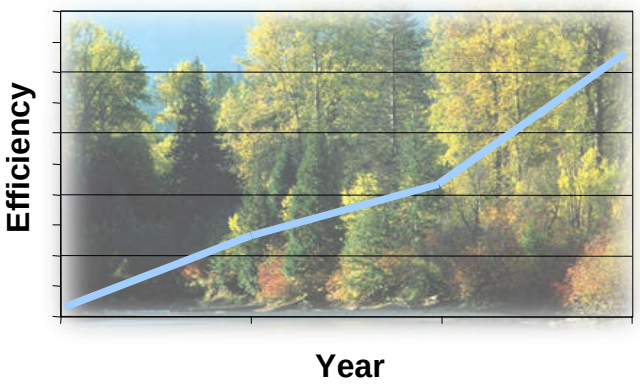
Start with the end in mind

Industry cooperating across traditional lines

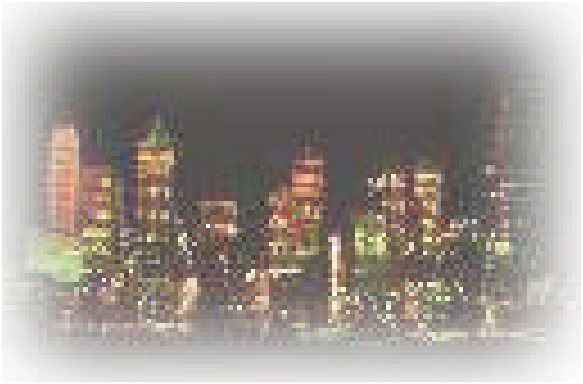
Adopt principles of contemporary system design

Public Benefits

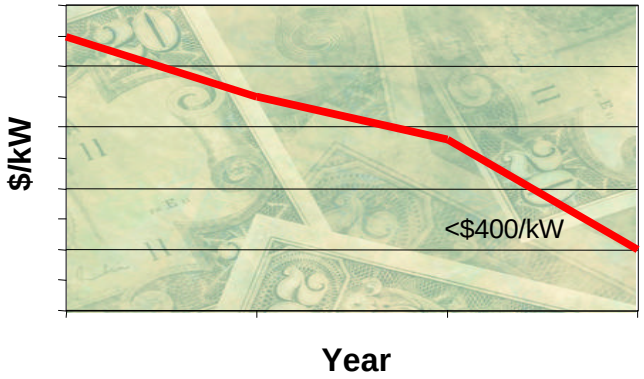
High Efficiency



Grid Stability



Cost Reduction



Responding to the Needs of the Nation

"Mass customization of fuel cell components for stationary, mobile, and military applications can lead to mass manufacturing and in turn, to much lower unit costs."

Bob Gee, Assistant Secretary for Fossil Energy

Responding to the Needs of the Nation